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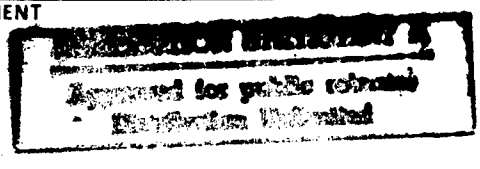

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The grant sponsored research on large-scale hydrographic changes that have occurred in the upper few hundred meters of the Arctic Ocean. We used data collected by US Navy submarines during 1993 and 1995 Scientific Ice Expeditions (SCICEX), by European icebreakers, and compared these data with a new climatology compiled using formerly classified data from Western and Russian sources.

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This grant sponsored research on large-scale hydrographic changes that have occurred in the upper few hundred meters of the Arctic Ocean. We used data collected by US Navy submarines during 1993 and 1995 as part of the SCientific ICe EXpeditions (SCICEX) project. Additionally, we used data collected by European icebreakers in 1991. Finally, we compared these data with a new climatology compiled using formerly classified data from Western and Russian sources. We found that during the first half of the 1990's, the Eurasian sector of the Arctic Ocean lost its insulating "cold halocline layer," resulting in a remarkable salinification of the upper waters of over 1 ppt. We speculated that this should reduce winter ice growth as warm water from the underlying Atlantic Water layer rises to the surface. We estimated a reduction in net ice growth of about 30%. Finally, we propose that these changes have been ultimately forced by meteorological shifts in surface winds, which have pushed riverine waters further eastward, i.e. away from the Eurasian Basin.

These results have been discussed in numerous workshops and conferences and have been published in the literature (Morison et al., 1998; Steele and Boyd, 1998).

References

Morison, J., M. Steele, and R. Andersen, Hydrography of the upper Arctic Ocean measured during the cruise of the nuclear submarine *USS Pargo*, *Deep Sea Research*, in press, 1998.

Steele, M. and T. Boyd, Retreat of the cold halocline layer in the Arctic Ocean, *J. Geophys. Res.*, 103, 10,419-10,435, 1998.